DOCUMENT RESUME

ED 429 553 IR 019 462

AUTHOR Schnackenberg, Heidi L.; Luik, Krista; Nisan, Yael; Servant, Colleen

TITLE Teacher In-Service Training, Technology, and Front-End Analysis. A Needs Assessment Report.

PUB DATE 1999-02-00

NOTE 15p.; Paper presented at the Annual Convention of the Association for Educational Communications and Technology (AECT) (Houston, TX, February 10-14, 1999). For the "Incorporation of Technology into Teaching" paper, see IR 019 464.

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150) -- Tests/Questionnaires (160)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Computer Uses in Education; *Educational Needs; Educational Technology; Elementary Education; Elementary School Teachers; Faculty Development; Focus Groups; Foreign Countries; Information Technology; *Inservice Teacher Education; Interviews; Needs Assessment; Questionnaires; Teacher Surveys; Training; Use Studies; Workshops

IDENTIFIERS Quebec; Teacher Needs; *Technology Integration; *Technology Utilization; Training Needs

ABSTRACT

This paper reports on a needs assessment, conducted in two elementary schools in Quebec, that examined the use that teachers are making of the computer facilities, as well as their skill and confidence levels in this area. The first section provides a general description of the project, details the sources of information, and discusses the reasons for performing the assessment. Results of the analysis are presented in the second section, including summaries of: interviews with the school board director, the regional technology coordinator, principals, computer resource teachers, and the technology integration specialist at the Quebec Ministry of Education; teacher focus groups; and teacher surveys. The third section presents recommendations, including: description of the performance gap (i.e., the gap between teachers' current use of technology and the ideal vision described by various members of the school community); general recommendations in the areas of professional development, pedagogical support, and technical support; and a format for a workshop to enable teachers to incorporate technology into their teaching. An appendix contains the teacher survey, including results. (DLS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Teacher In-Service Training, Technology, and Front-End Analysis
A Needs Assessment Report

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

H.L. Schnackenberg

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

1999 AECT National Convention

Heidi L. Schnackenberg (heidis@alcor.concordia.ca)
Krista Luik, Yael Nisan, Colleen Servant
Department of Education LB 564-9
Concordia University
1455 de Maisonneuve Ouest
Montreal, Quebec H3G 1M8
CANADA

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 429 553

The Context

General Description

As our society becomes an increasingly technological one, there is a movement within education to promote the integration of computer technology into the classroom. Within the province of Quebec, the Ministry of Education has authorized the expenditure of considerable sums of money for the purchase and upgrading of equipment in the schools over the next few years. A team of researchers at Concordia University is investigating the professional development aspects of this initiative. Several Quebec school boards are working in partnership with the university in order to explore the potential of using new technologies to enhance the curriculum.

The school board for which this needs assessment was conducted has been actively involved in promoting the use of computers within its schools for several years. It was determined in advance that the focus of this initiative would be on two particular elementary schools. The schools in question have well equipped computer labs with Internet access via satellite. The elementary teachers within this school board have basic word processing skills, they are confident in their use of the available educational software and have received introductory training about the Internet. Each teacher visits the lab with his or her class on at least a weekly basis. During this time they are primarily making use of the word processing and the other available educational software.

The challenge, at this point in time, is to determine how to move from the schools' current model of computer use to one where technology use is more fully integrated into the actual curriculum. It was also indicated that optimal use involved taking advantage of the access to information provided through the Internet. It is perhaps misleading to conceive of the difference between actuals and optimals in this situation as simply a performance gap. This new projected model of technology use is very much an innovation and still in development. The regional technology coordinator, for example, is very satisfied with the progress that the teachers have made to date and the ways in which they are presently making use of the available facilities. The director of the school board wants his teachers to develop confidence and an increased ability to see the opportunities and benefits offered by further technology integration.

Sources of Information

The following people were solicited for information either through personal interviews, focus groups or surveys. Teacher participation was on a voluntary basis and was confined to the two schools in question.

- School Board Director
- Regional Technology Coordinator
- Principals (2)
- Computer Resource Teachers (2)
- Teachers (19)
- Technology Integration Specialist at the Quebec Ministry of Education

Reasons for Performing the Needs Assessment

It was important to do a needs assessment to acquire a clear picture as to the actual use that teachers are making of their computer facilities as well as an indication of their skill and confidence levels in this area. We needed detailed information about previous training. Teachers' feelings about training and the current impetus toward computer integration were sought out. A full understanding of the available

IR019463

BEST COPY AVAILABLE

facilities and support, that is to say, the current situation with its related constraints and problems was essential in order to make well informed recommendations.

Since we are dealing with implementing an innovation which is still in the process of development, within a field that continues to evolve, defining optimals is both important and challenging. Within this needs assessment we needed to solicit a wide variety of opinions as to what might constitute optimal use of computer technology in these schools.

A thorough needs assessment helps to determine the character of an effective intervention specifically geared to the needs of the schools and school board in question. It enables us to make well-grounded recommendations to facilitate and support the further integration of computer technology.

Results of the Analysis

Data Collection Procedures / Project Schedule

The preliminary instruments were developed and assessed. They included outlines of structured interviews with the school board director, the regional technology coordinator and the computer integration specialist from the Quebec Ministry of Education. Questions focused on their visions of optimal computer use, their understandings of the current situation and actual use, as well as problems and possible solutions. The interviews were conducted on the 19th and 20th of November.

The information received during these interviews allowed us to develop the subsequent instruments in a more informed and precise manner. These instruments included outlines for structured interviews with the principals, the computer resource teachers, and small teacher focus groups, as well as an anonymous survey for participating teachers. The interview and focus group outlines followed a similar format to that used in the earlier instruments. Questions pertaining to their visions of optimal use of computer technology, current uses, facilities, support, and problems or constraints were included. There were also specific questions about previous training, and teachers' feelings about the training and the drive to integrate computers. The teacher survey consisted of fifty forced response questions where teachers were asked to rate their levels of skill, use, interest, satisfaction and confidence in several areas, as well as four open-ended questions.

We were obliged to collect all of this data during a single visit to both schools on December_1. The four focus groups varied in size from three to six participants. The surveys were distributed on the same day on the advice of the director in order to expedite their quick completion.

Summary of the Interview with the School Board Director

The school board director feels that the primary role of school is to help prepare students for the future. New technologies can afford us access to vast stores of information. The teachers' task or role is evolving into one where the teacher helps students to learn to assess, analyze and synthesize information. He said that technology can allow us to adopt a more child-centered and individualized approach. Given resources such as the Internet, teachers will be able to organize work around topics and themes that both peak student interest and motivation and enlarge their vision. The director is convinced that technology can be a powerful tool to improve student success by improving and expanding their ability and means to communicate.

The director spoke of his school board's emphasis on technology use during the last few years. Hardware has been provided to the schools in the form of well-equipped computer labs and teachers have received training in basic computer skills such as word processing and the use of specific educational software. They also have recently received introductory training about the Internet. He feels that the great majority of elementary teachers have proficient computer skills and are not fearful of using computers. The teachers are using the computer labs on a regular basis primarily for reinforcement rather than delivery of instruction.

The director described the available resource people. They include a computer resource teacher in each elementary school, the regional technology coordinator and the director of information services. The computer resource teacher helps other teachers by troubleshooting and contacting the technology coordinator for information or training. The technology coordinator provides training and supports teachers as new software is introduced and new programs are developed. The manger of information services is responsible for technical support.

The current goal, elaborated by the director, is to support teachers in taking the next step towards integrating computer technology into the curriculum with specific objectives. He feels that more technical and pedagogical support is needed to accomplish this. He recognizes that time, in a scenario where teachers are already working to full capacity, is the biggest obstacle. The director wants teachers to be afforded the opportunity to see the value in integrating technology, and be provided with training which addresses curriculum design and planning. To this end, teachers need to be shown what resources and opportunities are available, particularly on the Internet, and how to use them. He hopes that this initiative will build teacher's confidence in their use of new technology.

Summary of the Interview with the Regional Technology Coordinator

The regional technology coordinator for CEMIS, in his post since 1992, is responsible for promoting training, curriculum development and research and development for seven school boards. There is also a director of information services for this particular board who functions as the technical support person. The coordinator feels that they could use at least one more person due to the volume of their work. Technical and hardware problems can sometimes take several weeks to solve. Difficulties include problems with printers, weak service by the Internet provider and students muddling up the hardware. The coordinator confers with the computer resource teachers regarding theme integration, curriculum material and technical problems.

In recent years, considerable funding has been spent on hardware. The labs in these elementary schools are equipped with 486's and pentiums many of which have Internet access via satellite. The board is presently mounting the mail-server.

The training approach that has been followed to introduce new software to staff and students usually follows three sequential steps. First the coordinator models the use of the software with students in the teacher's class. During the next visit the coordinator team teaches with the teacher. On his final visit, the teacher teaches her/his own class with support from the coordinator. Training has also been offered in a workshop format, for example last spring when the teachers were introduced to the Internet.

The teaching staff of these two elementary schools have received training on various educational software programs, word processing, Windows operating systems as well as the Internet. Class modeling on the Internet was scheduled to begin the first week of December. Special projects within the board include the grade four Social Studies project, for which he developed the web site, and the Alabama Integrated Science Project.

The coordinator feels that the teachers' skills are excellent with the following software: Microsoft Works, Mathville and Storybook Weaver. He is happy with how teachers are currently using the available software and technology. He sees this as proof of their satisfaction with the training to date. The coordinator believes that at this stage teachers want integrated packaged thematic solutions. If such an approach is followed, he believes that computer integration will occur seamlessly. He points to the grade four Social Studies project as a possible blueprint of others yet to be conceived. He anticipates that the new access to curriculum consultants which will be available when the boards merge will help facilitate effective computer integration.

Summary of the Interviews with the Principals

This summary is an amalgamation of two interviews which were conducted with the principals of the schools in question. We will highlight their common perspectives in an effort afford a global view of their ideas and we will make mention of any significant differences.

In the principals' vision of an ideal scenario, technology, particularly the Internet, would be a practical tool integrated into the curriculum and used by students and teachers on a daily basis. One principal suggested that this type of access could be made possible by furnishing classrooms with several computers. The view that the computer is a means to tap into information sources world wide was expressed. This is perceived to be particularly important in a rural setting. However, both principals expressed concern over the effect increased use of technology might have on students' social skills. One of the principals expressed concerns about the cost of computer equipment and in-service training while the other felt that computers could result in savings if fewer textbooks needed to be purchased.

In terms of actual computer use, the principals shared the understanding that the schools' labs were being well used by all grade levels. Activities such as word processing particularly in Language Arts, Math

practice and remediation using available software, the grade four Social Studies project and report cards were mentioned by both principals. It was agreed that the teachers are generally using many of the computer skills that they've learned to date to the best of their ability.

Both principals agreed that pedagogical support was made available when requested, however as these resources are limited this restricts the access teachers have to this expertise. In one case the coordinator visits the school on a monthly basis while the second school rarely calls upon his services.

The technical support is also available though it is thought to be at times inconsistent and the communication process is complicated by the request forms used. Concern was expressed over equipment breakdowns; one of the schools had a lot problems with their printers, the other school mentioned the inconsistent and different operating systems on the computers.

It is felt that further computer technology training is generally considered a high priority among the teachers. The principals expressed that some teachers have mixed feelings about previous technical training and there is frustration over lack of time.

The principals considered time to be a major constraining factor. Teachers need time to learn about the new possibilities offered by computer technology and how these connect with learning and planning. They also need training to develop their self-confidence and feelings of empowerment. Both principals felt that teachers need sufficient pedagogical and technical support. The fact that all of the computers are concentrated in a lab format was also seen by one of the principals as limiting more effective computer integration.

Summary of the Interviews with the Computer Resource Teachers

This school board has chosen to recognize special expertise and contributions in the area of computer technology by designating a computer resource teacher in each elementary school. These teachers receive a nominal stipend. They make sure that the lab is running and they are available to help teachers solve basic problems. One of the teachers interviewed spends about two and a half hours per week helping teachers integrate technology. This includes, for example, doing searches for other teachers on the web and providing individual support for teachers. She meets with one particular teacher once a week for word processing with the students. The other teacher specified that she has a full teaching load over and above her responsibilities as computer resource teacher.

The computer resource teachers spoke of the goal of integrating or incorporating technology into curriculum areas. They both mentioned the desirability of having some computers in the classroom or library to facilitate this. Individual or small group access would then be possible on a daily basis. They feel that the advantages of integrating technology include increased student motivation and easy access to information in today's increasingly technological society. The computer is a tool for research and children need computer skills in this age. One of the teachers cautioned against possible over use.

The computer resource teachers speculated as to the effect that technology would have on traditional ways of teaching and learning and on the role of the teacher. Computers can complement the curriculum and they provide children with the means to produce finished products of a very high quality. Teachers will continue to be important especially as children need what one of the resource teachers called that 'human touch'. They will need more technical knowledge in order to guide the children in their learning rather than 'spoon-feeding' them.

The principals in each school were said to be very supportive. The technology coordinator was described as being very knowledgeable and available to them for support, but also as extremely busy. First acknowledging her perception that computer resources are better at this board than elsewhere, one of the teachers then spoke of recurrent problems with printers and the difficulties posed by different operating systems on the different computers. The other teacher felt that their lab works well, but that they are in need of new software and that some of the computers are not reliable and need upgrading.

The computer resource teachers described similar patterns of computer use in their schools. Word processing programs are used particularly in the area of Language Arts, drill and practice software is used for Math. CC mail is used within the Science program. The grade four Social Studies project was offered as a possible model of support for integration by one of the teachers. It was developed by a group of teachers in collaboration with a consultant from another board and the technology coordinator and involves classes throughout the board in interactive activities. Teachers are just beginning to make use of the Internet in the

schools. One of the resource teachers expressed an interest in creating a school web-page and a computer club for interested students.

Their colleagues' technical skills were described variously as 'getting better' and 'pretty high'. Both resource teachers emphasized the need for further training on the Internet. They both insist that teachers need to be directed to good web-sites, they need more guidance on how to find information, and then pedagogical training on how to integrate this into their teaching. One of the teachers also spoke of the need for additional training on e-mail use and on basic Windows '95 management. Teachers are ready to take the next step forward but they need useful ideas, time, support and direction. A help-line, and support groups were suggested for technical and emotional support as was release time to work on special projects. Most teachers feel that additional training in this area is a high priority however some have mixed feelings. Both resource teachers spoke of some of their colleagues feeling overwhelmed.

Summary of Teacher Focus Groups

During the four focus groups which were conducted by the undersigned as part of the needs assessment, "Technology Integration" was defined by the participating teachers as 'using computers in all areas of the curriculum for teaching, learning and reinforcement'.

Many teachers expressed the feeling that they would ideally like to have a few computers setup in their classrooms. They also stated how they felt that the lab format would be made much more accessible if a computer resource person were stationed in the lab on a regular basis. This would enable teachers to send individual students to the lab at different times and it would be a great support when they were using the lab with all of their students.

Teachers indicated a desire to develop purposes and objectives regarding the use of computers, but several teachers were unsure as to how they were expected to integrate computers at each grade level. They expressed a strong interest in learning to use the Internet as a pedagogical tool. They would also like to acquire a list of useful Internet sites for finding resources both for themselves and for their students.

In general, teachers are of the opinion that computers are motivating for their students and that using computers will help to prepare students for the future. They also spoke about how computers afford great access to information which is particularly useful in their rural setting.

On the other hand, some teachers expressed concern that too much exposure to computers may compromise students' social skills. Also, it is difficult for some teachers to use the facilities effectively due to the varying operating systems which are installed on the available computers. It was also stated that computers in general and the Internet in particular could cause students to stray away from the curriculum and that teachers may have little control over this occurring.

It was related that generally the available computers are presently being used for the preparation of Report cards, word processing in French and Language Arts, some Math practice and also at the Kindergarten level where students are developing basic computer skills. It was added that the older students are beginning to use the Internet and the schools are now in the process of setting up E-mail access.

Several teachers commented that they foresee their role changing due to the increased emphasis being placed on computer technology. They understand that they will become facilitators and students will be more in charge of their own learning. Some teachers perceive this as being a positive change while others feel that teaching will become more challenging and difficult.

Teachers stated that they really lack time to become sufficiently acquainted with new technology, find resources and share ideas with their colleagues. They would like more access to the facilities on a regular basis for their students. It was added that students vary a great deal in their ability to use computers due to the level of exposure they experience in their homes.

Concerning pedagogical and technical support, the general consensus among the teachers was that these services do not meet their needs. Previous training had little follow-up. They expressed great interest in additional training which would help them to integrate what they already know into their curricula. Kindergarten teachers also expressed their need for training on how to use computers with their students. Most teachers said that thus far they have few curriculum resources and due to technical difficulties, resources such as the Our Region project have not been used very much this year.

Teachers voiced the opinion that they do not expect to integrate computers overnight though regard it as a high priority.

Summary of the Teacher Surveys

Participation in this project was voluntary and nineteen teachers chose to complete the teacher survey. Results of the teacher surveys can be found in Appendix A on page 21. The survey requested basic information concerning teachers' backgrounds and it was found that those who completed the surveys were for the most part teaching in the first cycle. (52.6%) It was also noted, that more than one half of those participating have at least ten years of teaching experience (57.9%). The majority of teachers have been teaching with this school board for several years though three teachers are in their first year and so it is not assumed that they have received the same training as the regular teaching staff. Most teachers (89%) have a computer at home and more than one half (52%) also have an Internet connection.

The first section of the survey asked teachers to rate their perceived skill level in many areas of computer technology. The teachers generally rated their ability to use word-processing programs as being high and they rated their ability to use the Internet and E-mail as close to medium . Correlationally, the teachers reported that they and their students use the computer most frequently for word-processing. Teachers also stated that they often use the computer to create worksheets for their students and to do report cards which is now a requirement throughout the school board. Regarding the use of peripheral technologies such as scanners and digital cameras, the average teacher rated their ability as low . This is not surprising in light of the fact that they indicated that they have not yet received any training in these areas and do not have regular access to these technologies in their schools. It should be noted that the survey did not request that teachers rate their abilities using the educational software which is now available in their respective schools. Given the information that we have acquired elsewhere it would probably be safe to assume that the teachers would rate their abilities highly in this regard.

Teachers did express a high level of interest and a measure of confidence in their ability to integrate computer technology into their teaching.

Many teachers communicated that they would very much like to learn how to integrate the Internet into the curriculum and reported that they are attempting to do this minimally at this time. They also expressed an eagerness to acquire ideas and suggestions concerning projects geared for computer technology . It was also mentioned by many that they would like to have students enrich their Math skills by using the computers. According to many teachers it would be advantageous to have a few computers installed in individual classrooms.

With respect to the support services which teachers need in order to integrate computers effectively, training on using software and integrating the Internet was mentioned by many. Technical support was also frequently cited as a very important element in the process of integration.

Teachers reported that they have a high level of satisfaction with the support they receive from their principals regarding the integration of computer technology . They indicated that they were very satisfied with the existing facilities and the accessibility of the computers for themselves to explore the Internet and use E-mail though most teachers expressed that they have very little time to use these facilities.

Teachers referred to several advantages to integrating computer technology ; among these is the perception that computers are very motivating for students, the great access to information afforded by the Internet and the necessity of preparing students for the future through the use of technology. Teachers noted that the frequent technical problems due to inadequate technical support and their lack of knowledge makes using computers very discouraging and time consuming. They also felt that the lab format makes the computers inaccessible to students on a frequent basis.

Summary of Interview with the Computer Integration Specialist

The computer integration specialist has worked for the Quebec Ministry of Education within the Services for English Schools department since 1992. Her area of expertise is "integrating technology into the classroom". She has been directly involved in this area for the past eighteen months. She is a partner in a research project at Concordia University on integrating computer technology into schools.

She strongly believes that the computer is a valuable tool that needs to be integrated into the classroom. She feels that computers can change the teachers' traditional role and be an exciting challenge as this technology will force teachers to reflect upon their work and find better ways of doing things.

According to the computer integration specialist, a major benefit of integrating computer technology into classrooms, is that children will be afforded the opportunity to work with the tools of the

modern world. She stated that computers can encourage students to be more independent thinkers, better problem solves, and better collaborators. She also related that computers will also enable teachers to focus their attention on the individual needs of students. In addition, the specialists is of the opinion that using computers will make the students' school day more fun, active, creative, and productive. Thus, learning will become more interesting, exiting and authentic. Moreover, she believes that computers improve the way of life of society as a whole.

The specialist suggested that integrating computer technology may require a cluster or "pot" of computers in classrooms so that students can work cooperatively in groups of four or five on a single computer. She also added that classrooms will need to be organized so that computers are conveniently available for teachers to use.

The computer integration specialist indicated that the government policy stipulates that computers be integrated into the regular curriculum in all subject areas. She referred to the government "plan of action" which deals with this policy. However, she indicated that teachers are responsible for designing their own instructional materials that integrate computer technology.

She feels that the number of teachers integrating computers in their instruction is still in the minority though some teachers are making use of the Internet, home pages and computer presentation programs.

According to the integration specialist, one of the most important factors that inhibits teachers' use of computers is lack of teacher training which would allow teachers to develop professionally along with the technology. Time and adequate technical support are also considered to be factors which inhibit the process of integration.

The specialist indicated that computer integration will be facilitated by a step by step approach. She believes teachers need opportunities to discover their own skills and reflect on their work practices regarding what is working well and what is not. This will help teachers to understand what they need to learn in order to take the next step towards computer integration.

Recommendations

Description of Performance Gaps

As described above, we are essentially dealing with the implementation of an innovation rather than identifying a performance gap where employees work has not lived up to expectations. In this case there is a sliding scale of expectations, where the expectations of teachers are evolving as technology progresses and becomes more available in the schools. Many teachers are unclear as to what is expected of them. There is a gap between teachers' current use of technology and the ideal vision as described by the various members of the school community. This gap delineates the differences between the extent to which computers are expected to be integrated into the curriculum and how teachers are actually using them.

All sources described a similar picture of current computer use. This suggests that the picture which has emerged is an accurate one and speaks well of the different sources' knowledge of the system. They all agreed that computers are being used primarily for word processing, and for drill and practice programs within subjects such as Language Arts and Math. There is an innovative project, that has been produced for the grade four Social Studies program, which involves interactive classroom activities via computer. Information for the Alabama Integrated Science Project is made available through CC mail. Some teachers are beginning to make preliminary use of the Internet. The report cards are also being done by computer.

Our sources also expressed similar visions of optimal computer use. There was a consensus that computers should be further integrated into the actual curriculum. In addition to its potential to help teachers plan, research and design curriculum, it was indicated that computer technology should be used to help teach and develop the concepts within lessons for students.

Teachers and administrators spoke about the Internet as an extremely rich source of information. Teachers were enthusiastic about the possibility of communicating with people, and obtaining information, from around the world. Many felt that there will be an increasing emphasis on the teacher's responsibility to guide students, and to help them learn how to assess information and in developing critical thinking skills.

Because this situation might be looked at as both a performance gap and the implementation of an innovation, we have two ways of looking at the problem: What are the factors and constraints that are

currently inhibiting computer integration? What are the current strengths within the system upon which our recommendations might build, to support the implementation of more comprehensive technology integration?

Strengths:

- The teachers feel supported by their administration, i.e. school board and principals.
- The parent community is very supportive of computer integration.
- The schools are equipped with recent equipment with access to the Internet via satellite.
- The labs are sufficiently equipped so that all students in most classes can work individually on the computers.
- Most of the teachers have a computer at home, and more that one half have an Internet connection.
- The lab facilities are accessible to teachers at their convenience after school hours.
- The teachers have already received considerable training and support.
- Integrating computers into their teaching is a high priority for most teachers.
- Teachers have a high interest in receiving additional training.
- Teachers perceive their skill level in word processing as high and their skill level in searching the Internet and using E-mail as medium.
- Teachers use the computers to write report cards.
- Teachers are using the computers in a variety of subject areas, such as Math, Science, Social Studies and Language Arts.
- The coming amalgamation of the school board with other boards will provide the schools with subject consultants. This may address the need for additional pedagogical support for computer integration in various subject areas.
- The school board is willing to provide release time to teachers for professional development activities.
- Available resources facilitate delivering workshops on-site.

Weaknesses:

- Teachers already operate under considerable time constraints and learning to integrate technology takes time.
- Technical and pedagogical support is not sufficient, given the great demands required to integrate technology.
- There are frequent technical difficulties which take time to resolve.
- The educational software currently available in the labs is limited.
- Having the computers set up almost exclusively in a lab situation, makes class access to computers relatively limited and inflexible.
- The different operating systems on the different computers within each lab make it difficult when giving directions to students during lessons.
- Many teachers are unsure of what the curriculum objectives are regarding the use of computers at different grade levels.
- Not enough pedagogical direction exists for teachers interested in integrating computer technology into the curriculum.

General Recommendations

We have made recommendations in three interrelated areas based upon our understanding of the teachers needs: professional development, pedagogical support, and technical support.

Professional Development

It has been our finding that teachers want and need additional training and guidance on how to integrate computer technology into their teaching. Given their training history, and the schools' access to the Internet via satellite, we feel that it would be advantageous to focus immediately on enabling them to integrate technology based on their current skills. We feel that it is important to develop teachers' confidence in their ability to do this before any entirely new technical skills are introduced. For example, multimedia applications can be very useful when integrating technology into the elementary classroom. However, our decision is to focus on enhancing these teachers' current skills in the context of providing

them with a model of how to successfully integrate computer technology in their teaching. This model could later be adapted for other computer applications.

After the workshop, follow-up support will be provided as teachers try to implement what they have learned. The first stages of this support will be on-site. Additional support may be provided on-line. Follow-up support is an essential component of successful training.

The following priorities will be taken into consideration in designing the initial workshop:

- Due to the diversity of teachers' needs and skill levels, the workshop should make available a variety of activities geared to these needs.
- The workshop should provide teachers with the possibility to integrate what they have already learned from previous training rather than introduce them to a new array of technologies.
- Training should meet the needs of teachers at all grade levels of the elementary school.
- This training should provide teachers with the time necessary to explore some of the possibilities related to technology integration.
- Training should provide teachers with time to do visioning about the process of incorporating computer technology into their teaching.
- Training should have a project-based approach.
- Techniques on how to search the Internet purposefully should be strengthened.
- Teachers need tools to help them learn how to design curriculum that integrates computer technology.
- Training might focus upon reworking existing lesson plans to incorporate computer technology.
- Teachers might work in teams according to grade levels to brainstorm ideas and develop projects.
- Follow-up support is an essential element to successful training.

Pedagogical Support

We cannot stress enough the importance of ongoing pedagogical support in bringing about real innovation in the schools.

- Teachers need more pedagogical support to help them integrate computers into their curriculum.
- Teams of teachers might be released to research and develop curriculum materials that incorporate computers.
- Creative time tabling might be developed where teachers have fewer students in the lab at one time, so that they can deal more effectively with individual problems.
- Teachers should be provided with web sites where they can find useful resources that might help them develop curriculum which integrates computer technology.
- It was suggested that the on-line 'Our Region' resource could serve as a model for the development of other resources in different subject areas.
- The subject consultants who will be available due to the coming amalgamation of the school boards, should be encouraged to address the need for additional pedagogical support for integrating computer technology within their respective subject areas.

Technical Support

Without sufficient technical support and resources, teachers will be frustrated and hindered in their efforts to integrate technology. Thus we have recommended a combination of creative and sometimes costly possible suggestions.

- Improved availability of the computer resource teacher in the lab, either through additional release time or creation of a special position.
- Providing additional technical support, and improving the system of communication for reporting technical difficulties. Ex: installation of a technical 'hot-line', hiring a computer technician on a part-time basis.
- Student experts might be trained to assist teachers during lab time.
- A schedule might be setup where computer knowledgeable parents would volunteer to be in the lab on a regular basis.
- A cluster of computers that might be set up in the classrooms or at different locations around the school, making accessibility to computers more flexible for students and teachers.
- A computer set up in a quiet place for teachers' use would be advantageous.
- All computers within the lab should be equipped with the same operating system.

Recommended Workshop

Based upon our understanding of the teachers needs as revealed by the data collected in this needs analysis, the following workshop has been proposed as an initial vehicle for enabling teachers to incorporate technology into their teaching:

Day 1: A workshop where teachers bring in two lesson plans and work in pairs (according to either their computer literacy level or the grade they teach) and rework the lesson to incorporate technology. The training will start with a brief introduction and then the teachers will begin the workshop by learning about the process of incorporating technology into their lessons. This process will include steps such as analyzing their existing lesson plans, reflecting on teaching/classroom management practices they are already familiar with, and brainstorming about where in the existing lesson plan they see a computer application fitting in. The pairs will then perhaps do some case scenarios (illustrating hypothetical lessons and answering questions about how to improve or alter them) in order to practice this process that they've just learned. The teachers will then go to computer stations and begin practicing with the available software at the school or browsing the internet to find the resources they need to revise the lesson plans they brought with them. Each member of the Concordia team involved in the workshop will be working with the teacher pairs as they try and utilize the computer resources to incorporate into the lesson plans they brought with them. At the end of the day, each teacher will briefly orally present or describe to the rest of the group their original lessons and how they've revised them.

Day 2: Each teacher will implement one of the lessons they created in the workshop in their class. One Concordia team member will be with the teacher as they implement in order to ease the transition into teaching with technology for the teacher. After implementation, the teacher will briefly discuss the areas of success and improvement of the lesson with the Concordia team member. Perhaps the teachers may keep journals as well so that they can track their progress and feelings as they begin, and progress through, this process.

Day 3: Each teacher will implement the other lesson they created in the workshop in their class. One of the other teachers will be with the teacher as they implement in order to help each other. After implementation, the teacher will briefly discuss the areas of success and improvement of the lesson with the other teacher verbally and email the Concordia team their reactions or feelings.

On both of these days, a technician will need to be on call to troubleshoot hardware/software problems for the teachers.

Day 4: The original workshop group reconvenes and discusses as a group the pros and cons, frustrations and successes they experienced. After the discussion, the teachers and Concordia team members will use the Technology Planning document (created by Deborah Gross and Eva Bures) to do some visioning on where they would like to proceed in the area of incorporating technology into teaching. The teachers will be asked to create another lesson plan incorporating technology on their own after the workshop.

Day 5: The teachers will implement their technology lesson alone and email us their reactions.

These days are intended to occur sequentially to keep continuity in the overall process/goal, but not necessarily all in one week as that would be impossible. Also, each school, Laurentia and Morin Heights, will go through the 5 day model separately.

Because training and further computer integration is a high priority for the teachers at these two schools, we anticipate that the proposed workshop will be positively received. The Concordia team, in partnership with the Laurentian Schoolboard, would be pleased to have the opportunity to assist these teachers in their evolution towards appropriate integration of computer technology to meet curriculum objectives.__

APPENDIX A
Teacher Survey

Background Information

Within which cycle do you teach? First Cycle: 52.6% Second Cycle: 31.6% Both: 15.8%

How long have you been teaching?
First year: 10.5% 2-5 years: 21.1% 6-10 years: 10.5% 11-20 years: 26.3% over 20 years: 31.6%

Is this your first year teaching at the Laurentian School Board? Yes: 15.8% .No: 84.2%

Do you have a computer at home? Yes: 89.5% No: 10.5%

Do you have Internet access at home? Yes: 52.6% No: 47.4%

Scale:

Very Low:	1
Low:	2
Medium:	3
High:	4
Very High:	5

	Very Low	Low	Medium	High	Very High
Please rate your *skill* level in the following areas:					
1) Using a word processing package (ex: Word)		5.3%	52.6%	26.3%	15.8%
2) Using spread sheet programs	36.8%	26.3%	26.3%	5.3%	5.3%
3) Using data base programs	47.4%	36.8%	10.5%		5.3%
4) Creating multimedia presentations (ex: PowerPoint)	78.9%	21.1%			
5) Using a digital camera and related software	84.2%	10.5%	5.3%		
6) Using a scanner	63.2%	21.1%	10.5%		5.3%
7) Using e-mail	26.3%	26.3%	21.1%	15.8%	10.5%
8) Searching the Internet	5.3%	36.8%	26.3%	15.8%	15.8%
9) Creating web-pages	89.5%		15.8%		
10) File management	36.8%	36.8%	21.1%		5.3%
11) Graphics Management	52.6%	31.6%	10.5%		5.3%
Please rate your frequency of *use* of the following:					
12) I use the computer to prepare report cards			11.1%	27.8%	61.1%

* one person did not respond

BEST COPY AVAILABLE

	Very Low	Low	Medium	High	Very High
13) I use the computer to manage information about my students and their work	31.6%	21.1%	36.8%	5.3%	5.3%
14) I use the computer to prepare worksheets for my lessons	10.5%	26.3%	5.3%	31.6%	26.3%
15) I find lessons/units on the Internet	68.4%	10.5%	15.8%	5.3%	
16) My students communicate with experts through the Internet	84.2%	15.8%			
17) My students research assignments using the Internet	68.4%	21.1%	5.3%	5.3%	
18) I take part in educational forums (such as listservs) on the Internet	89.5%	5.3%		5.3%	
19) I communicate and share ideas with colleagues using e-mail	63.2%	21.1%	10.5%	5.3%	
20) My students use e-mail to correspond with other schools * one person did not respond	88.9%	5.6%	5.6%		
21) My students use word processing programs to create stories and other written work	21.1%	10.5%	36.8%	26.3%	5.3%
22) My students create projects related to curriculum units on the computer	52.6%	26.3%	10.5%	10.5%	
23) The computer is used to produce the final draft of students' written work	26.3%	21.1%	26.3%	15.8%	10.5%
24) My students check their spelling using the computer * one person did not respond	55.6%	16.7%		27.8%	
25) My students practice math skills on the computer	15.8%	21.1%	47.4%	15.8%	
26) I create web-pages for students' use	100%				
27) My students create web-pages	100%				
28) My students use educational CD Roms	47.4%	15.8%	21.1%	10.5%	5.3%
29) My students use the computer for recreation	26.3%	5.3%	31.6%	26.3%	10.5%
30) My students create pictures using a computer graphics program	36.8%	21.1%	21.1%	10.5%	10.5%

Please rate your level of *interest* in the following areas:	**Very Low**	**Low**	**Medium**	**High**	**Very High**
31) Integrating computer technology into my teaching			26.3%	42.1%	31.6%
32) Exploring the Internet for personal interest	5.3%	5.3%	26.3%	42.1%	21.1%
33) Finding teaching resources on the Internet		10.5%	21.1%	36.8%	31.6%
34) Having students use the Internet for research	5.3%	21.1%	15.8%	36.8%	21.1%
35) Additional training on integrating technology			26.3%	26.3%	47.4%
36) Help with classroom management when integrating technology (ex. articles,, on-site support, etc.)	10.5%		21.1%	36.8%	31.6%
Please rate your level of *satisfaction* with:					
37) Previous training/support with available software	10.5%	36.8%	42.1%	10.5%	
38) Training about the Internet	5.3%	42.1%	31.6%	21.1%	
39) Support from the principal for integrating computer technology * one person did not respond	5.3%	5.3%	15.8%	47.4%	21.1%
40) Support from the school board for integrating computer technology	5.3%	21.1%	15.8%	47.4%	5.3%
41) Existing computer facilities in the school		15.8%	15.8%	47.4%	21.1%
42) Accessibility of computer facilities for my students		15.8%	42.1%	36.8%	5.3%
43) Accessibility of computer facilities for myself to use e-mail or explore the Internet * one person did not respond	5.6%	16.7%	27.8%	22.2%	27.8%
44) Support when technical difficulties are encountered * one person did not respond	22.2%	27.8%	16.7%	11.1%	22.2%
Please rate your level of *confidence* regarding:					
45) Your ability to integrate computer technology into your teaching	15.8%	26.3%	36.8%	10.5%	10.5%
46) Ability to use the Internet	15.8%	21.1%	26.3%	21.1%	15.8%
47) Teaching students to use the Internet	26.3%	26.3%	26.3%	10.5%	10.5%

How would you rate the amount of *time* you have available:	**Very Low**	**Low**	**Medium**	**High**	**Very High**
48) To communicate with colleagues using e-mail	26.3%	42.1%	21.1%	10.5%	
49) To explore the web for teaching resources	15.8%	52.6%	21.1%	10.5%	
50) To learn about further integrating computer technology into your teaching	5.3%	52.6%	28.9%	13.2%	